

Navajo Abandoned Uranium Mine

Site Screen Report

This form is for use at the site of abandoned uranium mines (AUM) located on Navajo Nation lands. Applicable sites include all mine and mine features that have or have not undergone reclamation by the Navajo Abandoned Mine Lands Reclamation Program, including features, adits, pits and waste piles. Applicable sites also include all AUM sites listed in the USEPA CERCLIS database, all sites listed in the 2008 AUM GIS Report issued by USACOE and USEPA, all AUM sites on allotment lands associated with the Navajo Nation, and any and all AUM sites not listed in any database located on Navajo lands. Reconnaissance of any sites located on lands adjacent to Navajo lands that may be impacting Navajo lands will need to be coordinated with the authorities appropriate to those lands.

The purpose of the form is to ascertain the status and location of the identified AUM site, and record all immediate site information associated with the mine site. Decisions and recommendations on what additional steps are needed will be provided on a separate document.

Mine Name: Morale Mine
Mine ID: 291

Navajo AUM Southern Region

Prepared by:

Weston Solutions, Inc.

Contract: W91238-06-F-0083

20074.063.039.0020

April 2012

Part I Site Identification, Location and Status**Site Names and ID numbers as applicable****Mine ID:** 291**Map ID:** S4**CERCLIS:** NNN000909314**Navajo Abandoned Mine Land Reclamation Program:** None**Local name / Aliases:** Morale Claims; Seth-La-Kai Diatreme; O'Haco-Robinson**Chapter and local area:** Indian Wells**County:** Navajo**State:** AZ**Lat/Long:** 35.4725889936 N / -110.044484492 W**Nearby road and highway:** Indian Route 15**Local Post Office:** Indian Wells, AZ**Surface Land Status: check one or more and provide ownership and contact information below****Tribal Trust Land**☒**Private**☐**Bureau of Land Mgmt**☐**State**☐**Public lands**☐**Tribal Fee Land**☐**Allotment**☐**Fee land**☐**Subsurface Mineral Rights:**

No information on subsurface mineral rights ownership was found in the EPA/AUM Database.

Claim and operator information:

Historical documents identified the operator of the mine in 1954 and 1956 as Calvin and Ruth Chee, from 1954 to 1955 as M.K. Robinson, M.J. O'Haco, and Robert Lukius, and from 1956 to 1960 as Twin States Uranium Co., Inc. (Robinson and O'Haco). No additional historical ownership / lease information was identified in the EPA / AUM database.

Number of residential structures within 200 feet of mine: None

Part II Summary of Radiological Readings

Mine ID: 291

Highest gamma radiation measurement: 407,775 counts per minute (cpm)

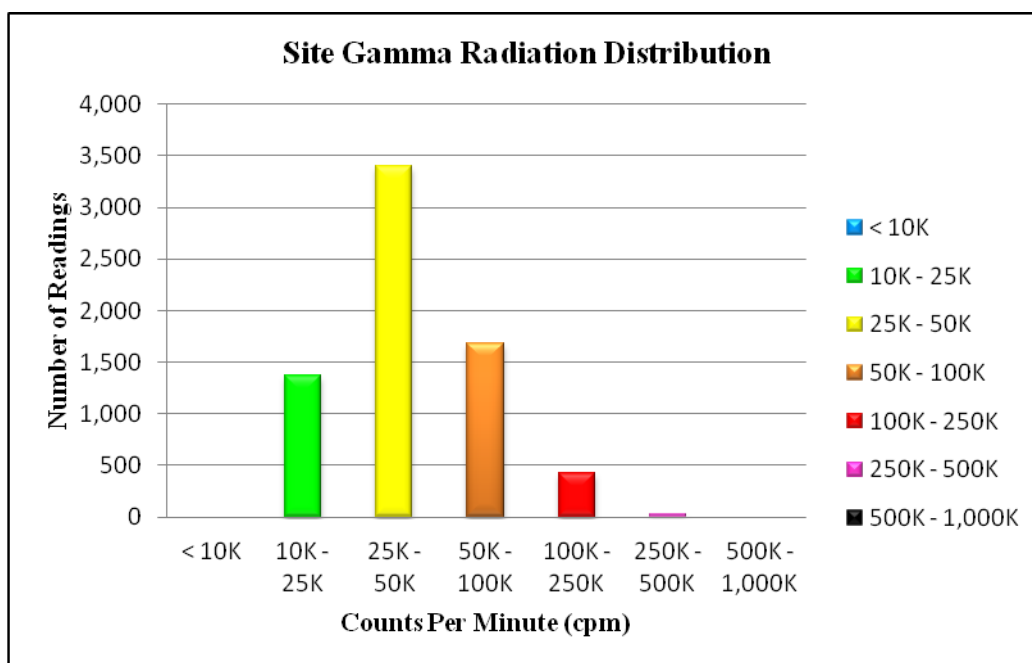
Background Average: 12,416 cpm **Two Times Background:** 24,832 cpm

Describe any other radiological measurements:

A total of 6,903 gamma radiation measurements were collected from the mine site, ranging from 15,011 cpm to 407,775 cpm. Maximum levels of approximately 350,000 cpm were found in the vicinity of the waste rock, 70,000 cpm were found near the fenced corral, 110,000 cpm along the eastern slope, and 400,000 cpm were found in the northeast drainage. The measurements are represented in Figures 1 and 2.

Distribution Chart and Statistics:

Site Gamma Radiation Statistics	
Number of Readings	6,903
Minimum (cpm)	15,011
Maximum (cpm)	407,775
Mean (cpm)	48,134
Median (cpm)	39,211
Standard Deviation	34,163



Part III Status of Reclamation and Mine Waste

Mine ID: 291

The following information was obtained from the Navajo Abandoned Mine Land Reclamation Program (NAMLRP) Point Features Database:

NAMLRP Status of the mine site: Reclaimed: Yes Waste Pile onsite: No

NAMLRP Project Number: NA-0751

NAMLRP Mine features: 1 Portal

The following information was obtained from field observations collected during the 2011 site screening:

Provide description and status of all mine sites and features at site. Include all waste piles, adits, pits and other features, and indicate whether they are open, closed, covered, capped, buried or unreclaimed. Indicate approximate size, shape and extent, including description of any reclamation caps. Note condition of all caps.

Observed reclamation work and status:

Adits:

None Observed

Waste Piles:

Waste pile, approximately 15' x 15', black rock and white dirt

Pits:

None Observed

Shafts:

None Observed

Other Debris and Mine Features:

None Observed

Part IV Site Observations and Environs**Observed Residential Structures (number and human habitation status of structures at the following distances from the mine site):**

0 to 200 feet: None Observed

200 feet to 0.25 mile: None Observed

Observed Public or Commercial Structures (schools, clinics, Chapter Houses, places of business and any other structures used by members of the community at the following distances from the mine site):

0 to 200 feet: None observed

200 feet to 0.25 mile: None observed

Levels measured around the perimeter(s) of the identified structure(s):

None

Observed Water Sources (number and type of wells and surface water sources that are potentially used for human consumption at the following distances from the mine site):

0 to 0.25 miles: Onsite - Windmill pump atop site mesa, associated water Tank at bottom of the mesa, on the eastern side of the site

0.25 miles to 4 miles: 0.5 mi SE - Pond; 1.5 mi SE - Spring and catchment (851)

Sensitive Environments (all sensitive environments located within visible range of the mine site, including: wetlands, endangered species, habitats and approximate locations of sites that may be under protection of the government of the Navajo Nation):

None observed

Known Site History (information from interviews with Chapter officials and residents and database review, includes: mine ownership, type of mining operation, period of operation, known amount of production, and any other information provided):

The Morale Mine mine claim consists of an area of 259,612 m². The mine was identified as being operational from 1954 to 1959. While operational, the mine had a total reported production volume of 192 tons. No additional historical ownership / lease information was identified in the EPA / AUM database.

Part V Response Action Summary

Summary of Evaluation Factors:

Accessibility:

Was the mine easily accessible to potential human activity?

Yes

Radiological Measurements:

Were any gamma radiation measurements collected at the mine greater than two times the site-specific background levels?

Yes

Waste Piles:

Were any unreclaimed waste piles observed at the mine with gamma radiation measurements greater than two times the site-specific background levels?

Yes

Structures:

Were any structures observed within 200 feet of the mine?

No

Potential Drinking Water Sources:

Were any potential drinking water sources observed within 4 miles of the mine?

Yes

Reclamation:

Was the mine reported to be previously reclaimed, or did the mine appear to be reclaimed?

Yes

Part VI Photos



Photo 1

Mine Site #291



Photo 2

Mine Site #291 – View from site



Photo 3

Mine Site #291 –Fenced corral



Photo 4

Mine Site #291



Photo 5

Mine Site #291



Photo 6

Mine Site #291 – Drainage with elevated gamma



Photo 7

Mine Site #291 – Water tank



Photo 8

Mine Site #291 – Windmill pump



Photo 9

Mine Site #291



Photo 10

Mine Site #291



Photo 11

Mine Site #291



Photo 12

Mine Site #291 – Waste pile

Part VII Contact Reports and Information

Name: Eugene Esplain

Title or official role (if any): Navajo EPA Superfund Program

Telephone number: (928) 871-7331

Address: PO Box 2946, Window Rock, AZ 86515

Information provided: Lead Regulatory Agency

Name: _____

Title or official role (if any): _____

Telephone number: _____

Address: _____

Information provided: _____

Name: _____

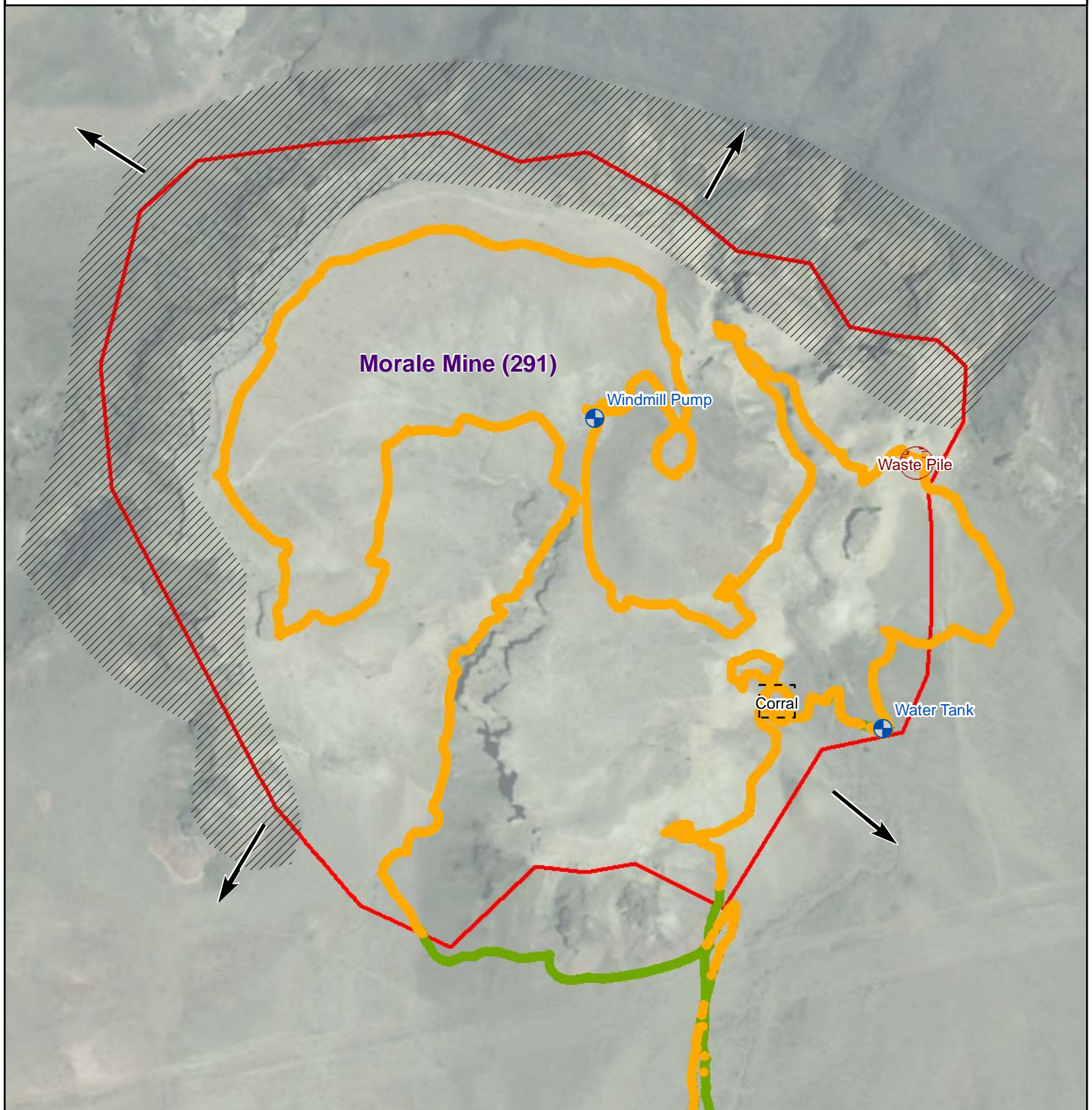
Title or official role (if any): _____

Telephone number: _____

Address: _____

Information provided: _____

**Figure 1 - Gamma Radiation Measurements, Above Two Times Background
Morale Mine (291)
Indian Wells Chapter, Navajo Nation**



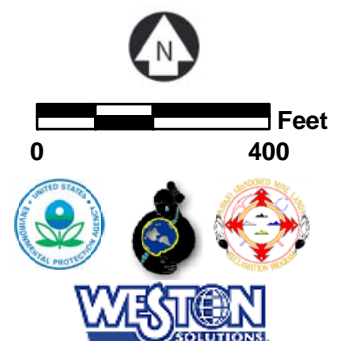
Gamma Radiation Measurements

- < 2X Background
- > 2X Background

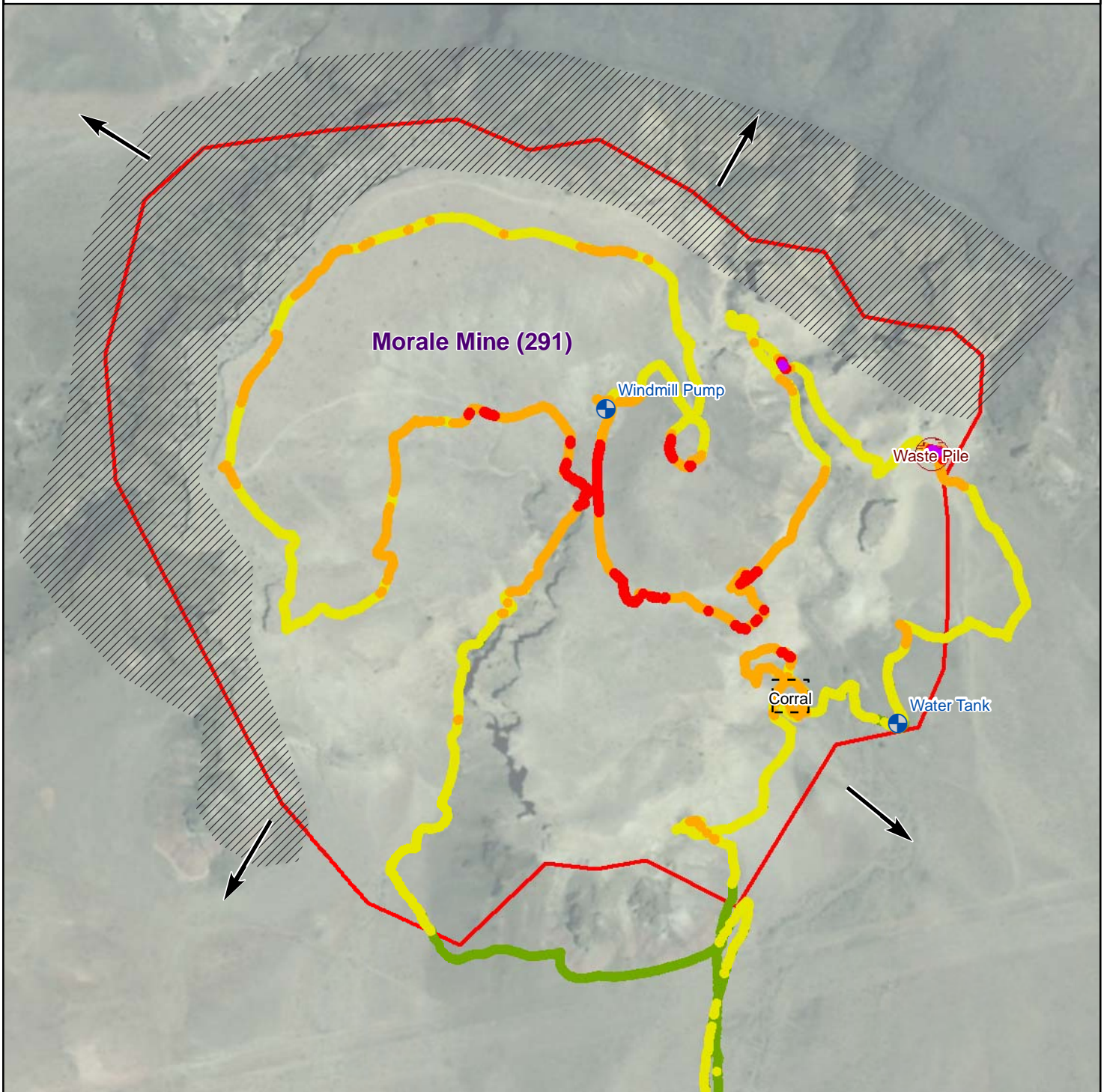
Measured as counts per minute (cpm)

Average background 12,416 cpm

- Mine Site Boundary
- General Slope Direction
- Observed Reclamation Feature
- Observed Waste Rock
- Observed Structure
- Observed Adit



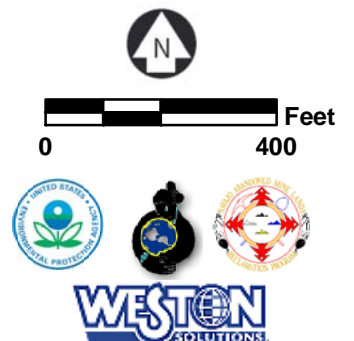
**Figure 2 - Gamma Radiation Measurements
Morale Mine (291)
Indian Wells Chapter, Navajo Nation**



Gamma Radiation Measurements

- 0 - 10,000 cpm
- 10,000 - 25,000 cpm
- 25,000 - 50,000 cpm
- 50,000 - 100,000 cpm
- 100,000 - 250,000 cpm
- 250,000 - 500,000 cpm
- 500,000 - 1,000,000 cpm

- Mine Site Boundary
- General Slope Direction
- Observed Reclamation Feature
- Observed Waste Rock
- Observed Structure
- Observed Adit



Average background 12,416 cpm

Measured as counts per minute (cpm)